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**EUROPEAN PATENT APPLICATION**

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⑤4 A seat.

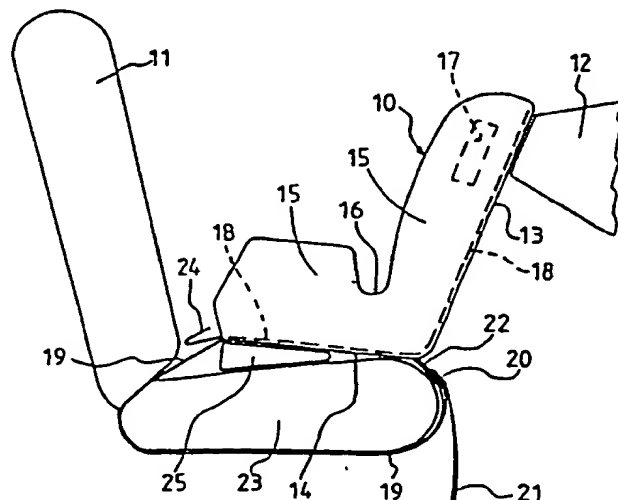
(57) A seat for use as a child seat in a vehicle, comprising a seat member (23), a back member (13) and side members (15).

At least the seat member comprises a layer (18; 30) of a high strength material, for fixing attachment straps (19). The attachment straps are arranged for tightening around an existing seat (23) in the vehicle.

The straps are arranged for tightening also an insert pillow (27) between the bottom of the seat and the seat in the vehicle.

An existing hip belt in the vehicle is arranged to fix the seat by means of an anchoring member (24) at the front edge of the seat attached to the layer of a high strength material.

FIG. 1



### A SEAT

The present invention relates to a seat, more precisely a child seat in a vehicle and of the type comprising a seat member, a back member and side members.

The problem according to the invention is to accomplish a seat structure that represents an optimum of simplicity when mounting in practically any vehicle and at the same time provides a maximum of safety.

The structure aimed at should also be such that it is optional to mount the seat in the forward or backward direction of the vehicle, in the front seat or back seat of the vehicle.

The structure should also be such that the seat is easy adaptable to the body size of the child.

Today there exist a great variety of very excellent child seats. In most cases the safety is very good.

However, sometimes the mounting of such seats may cause very much trouble in spite of the fact that the seats are accompanied by comprehensive mounting instructions.

Disregarding the fact that it may be difficult to identify the correct points of attachment to the structural elements of the vehicle, sometimes the vehicle has been modified as to the structure thereof without "adapting" the mounting instructions.

Thus, it would be extremely desirable to offer a seat which cannot be mounted wrongly in practice - not even by technically completely unskilled individuals.

The main object of the invention is that which just has been said.

A further object is to accomplish a simple adjustment of the seat member angle of the seat.

A further object is to make the easy mountable and easy angle adjustable seat adapted to the actual body size of the child.

The invention provides a seat for use as a child seat

in a vehicle, comprising a seat member, a back member and side members.

The seat is distinguished in that at least the seat member comprises a layer of a high strength material for fixing attachment straps, in that the attachment straps are arranged for being tightened around an existing seat in the vehicle, in that the straps are arranged for tightening also an insert pillow, preferably of a somewhat resilient material, between the bottom of the seat and the seat in the vehicle, and in that an anchoring member is attached to the layer of high strength material at the front edge of the seat and is arranged for being gripped by an existing belt in the vehicle.

In one embodiment the layer of high strength material comprises at least one plate.

The attachment straps comprise two length adjustable straps attached to the plate at the front edge of the seat, and two strap fastening members at the back edge of the seat.

The straps are preferably arranged to place the seat with the back thereof in the driving direction, in which case the seat member angle of the seat is determined by the placement of the insert, preferably of a somewhat resilient material, relative the front edge of the seat and if applicable dependent on the compression degree of the insert, the seat being so designed that it has a back having at least a portion thereof for abutment against the instrument panel of the vehicle.

Preferably, said anchoring member is arranged for being gripped by the hip belt in the vehicle.

Preferably, the plate covers the major part of the bottom side of the seat and also the major part of the outside of the back.

The sides of the seat are arranged to extend along the seat member as well as the back member and are arranged to accomodate inserts that adapt the seat to the body size of the seat passenger.

In a second embodiment of the invention the layer of a

high strength material comprises a fibre fabric reinforced layer of wear resistant material.

Preferably, the layer extends along the entire back of the seat including the back member and up onto the side members of the seat.

The fibre fabric may, with advantage, comprise carbon fibres and the wear resistant material may comprise a plastics material.

The invention will now be exemplified by reference to the accompanying drawings, where  
Figure 1 in a schematic view shows the seat placed generally horizontal in a vehicle,  
Figure 2 shows the seat inclined,  
Figure 3 shows in a side view a second embodiment of the seat according to the invention,  
Figure 4 shows details of the seat in Figure 3,  
Figure 5 is a view from above of the seat in Figure 3 and 4,  
Figure 6 is a partial section view of one back corner of the seat, and  
Figure 7 is a partial section view of the seat according to the second embodiment of the invention.

In Figure 1 there is shown a child seat 10 placed on the front seat 11 in a vehicle. The reference numeral 12 denotes a portion of the instrument panel of the vehicle against which the back 13 of the seat 10 abuts.

The seat 10 comprises a seat member 14, a back member 13 and side members 15 on both sides of the seat member and the back member, substantially along the entire depth and height thereof. In each side there is a cut-out 16 which in a manner known per se is arranged to fix the hip belt of the vehicle when the seat is mounted in the driving direction of the vehicle. Along the sides of the seat there are known means 17 for fixing the position of the diagonal belt of the vehicle.

A plate 18, preferably of metal, or metal plates joined to each other are arranged for covering substantially the entire bottom 14 of the seat and the back 13. A pair of

straps 19 of a high strength material (only one shown in the figure) are attached at the front edge of the seat plate and are provided with means 20 for length adjustment at the free strap end 21. Said means for length adjustment has a coupling member which is placed in an attachment member 22 anchored to the plate 18, and preferably having the same type of strap as the strap 19.

As appears from the figures the free strap end 21 is easily available at the front edge of the vehicle seat for allowing the correct placement relative to the seat 23.

At the front edge of the seat member of the child seat there is an anchoring member 24 attached to the plate 18 or integrally formed with the plate. The hip belt 28 of the vehicle is intended to be brought into the hook that is shown and by means of a suitable length adjusting means safely fix the child seat from being released in case of a collision or heavy braking.

The angle of the seat 10 relative to the horizontal plane is set by means of an insert 25, preferably of a somewhat resilient material. The placement of this insert relative to the front edge of the seat member of the seat, and of course the size of the insert as well as the degree of compression thereof, if the insert is resilient, determines the angle of the seat.

As the angle positioning of the seat is obtained by rotating the seat unhindered around a line coinciding with the lower edge of the seat, and as this may be accomplished together with a feasible adjustment of the seat 11 in the longitudinal direction, in practice there will be obtained an unlimited number of adjustment positions for all existing actual body sizes. There are inserts 25 in different dimensions as might be required.

In excess to angle adjustment, which basically is a continuous adjustment, the sides 15 of the seat are provided with means, for instance of a Velcro-type, for attaching of an insert 27 of a suitable thickness and thereby adaption of the width of the seat member and the back member to the actual body size.

By means of the possibilities of variation obtained by using different inserts 25 and 27, the seat may be used for children upto 7 years.

It is not necessary to arrange the anchoring member 24 at the front edge of the seat, it may for instance be placed under the bottom 14 or at another place.

The seat may be tightened by means of the straps 19 and the hip belt 28 without having the back 13 of the seat abutting against the instrument panel.

The seat 29 in Figure 3 has a modified reinforcement.

Instead of the reinforcing plate layer in Figures 1 and 2 there is a fibre fabric reinforced outer layer 30 of a wear resistant material attached to the seat. In Figure 3 the layer 30 is attached to the entire back and bottom of the seat, as indicated by the line of extension 31 in Figure 4. The layer extends also a short distance around the seat corners up onto the sides of a seat, as shown in Figure 6.

Preferably, the fibre fabric is a carbon fibre fabric. Other fabrics having similar strength characteristics may of course be used. The wear resistant layer incorporating the fibre fabric may be a layer of plastics, for instance of the vinyl type.

Straps 32 for anchoring the seat to a vehicle mounted seat extend through slots in the layer 13 of high strength material, preferably a material of high tensile strength and of the carbon fibre reinforced type mentioned. Such slots maintain the straps in a fixed position relative the bottom of the seat, meaning that the slots establish well defined, in practice almost fixed through passages for straps 32 and connection strap pieces 32a. As appears from Figure 3 there is a coupling device between each strap 32 and each strap piece 32a allowing tight fastening of straps 32 and 32a around the vehicle mounted seat.

The free ends of the straps 32 and 32a are attached to plates 33, 34 and 35 (Figure 7), preferably of metal, placed against the upper side 36 of the seat body 37. The body consists of a constructional cellular plastics, for



instance STYROPOR.

In Figure 4 there is a more detailed view of the seat. Reference numeral 38 denotes an outer clothing of a suitable synthetic material, for instance polyamide. Reference numeral 39 denotes side pieces of cellular plastics, reference numeral 40 denotes a shock absorbing cellular plastics layer, 41 denotes a seat contact layer also of cellular plastics, 37 denotes the body of STYROPOR and 30 denotes the reinforcing fibre fabric.

In the embodiment of the seat shown in Figures 3 to 7 the combination of the fibre reinforced outer layer 30 covering the back of the seat and the cellular constructional plastics of the body form a composite seat structure that withstands extremely high strain of the type that might occur in a car accident. The high tensile strength characteristics of the layer 30 prevents the slots, through which the attachment straps are guided, from being torn up, instead the slots form an efficient means for fixing the position of the straps relative the bottom at the lower side of the seat.

The attachment of the straps to plates at the upper side of the seat form an efficient anchoring means for the straps.

The flexible outer high tensile strength layer 30 eliminates concentration of strain in that any deformation tendency of the body 37 immediately is transferred to the layer 30 and uniformly distributed along the layer.

Although a specific embodiment of the invention has been described with reference to the drawings, it is realized that the inventive idea of course is delimited only by the accompanying claims.

CLAIMS

1. A seat for use as a child seat in a vehicle, comprising a seat member (23), a back member (13) and side members (15), c h a r a c t e r i z e d in that at least the seat comprises a layer (18; 30) of a high strength material for fixing attachment straps (19), that the attachment straps are arranged for being tightened around an existing seat (23) in a vehicle, that the straps are arranged for tightening also an insert pillow (27), preferably of a somewhat resilient material, between the bottom of the seat and the seat in the vehicle, and that an anchoring member (24) is attached to the layer of high strength material at the front edge of the seat and is arranged for being gripped by an existing belt in the vehicle.

2. A seat according to claim 1, c h a r a c t e r - i z e d in that the layer of a high strength material comprises at least one plate.

3. A seat according to claim 1, c h a r a c t e r - i z e d in that the attachment strap comprises two length adjustable straps (19) attached to the plate (18) at the front edge of the seat, and two strap attachment members (22) at the back edge of the seat.

4. A seat according to claim 3, c h a r a c t e r - i z e d in that the belts are arranged to place the seat with the back thereof in the driving direction, and that the seat member angle of the seat is determined by the position of the insert relative the front edge of the seat and the size of the insert, the seat being such that a back (13) thereof has at least a portion for abutment against the instrument panel (12) of the vehicle.

5. A seat according to anyone or any of the preceding claims, c h a r a c t e r i z e d in that the anchoring member (24) is arranged for being gripped by a hip belt in the vehicle.

6. A seat according to anyone or any of the preceding claims, c h a r a c t e r i z e d in that the plate (18) covers the major part of the lower side of the seat and the major part of the outside of the back.

7. A seat according to anyone or any of the preceding claims, c h a r a c t e r i z e d in that the sides of the seat extend along the seat member as well as the back member and are provided with means (26) for accomodating an insert (27) that adapts the seat to the body size of the seat passenger.

8. A seat according to claim 1, c h a r a c t e r - i z e d in that the layer of high strength material comprises a fibre fabric reinforced layer (30) of a wear resistant material.

9. A seat according to claim 8, c h a r a c t e r - i z e d in that said layer extends along the entire back of the seat including the back member and up onto the side members of the seat.

10. A seat according to claim 9, c h a r a c t e r - i z e d in that the fibre fabric comprises carbon fibres, and that the wear resistant material comprises a plastics material.

FIG. 1

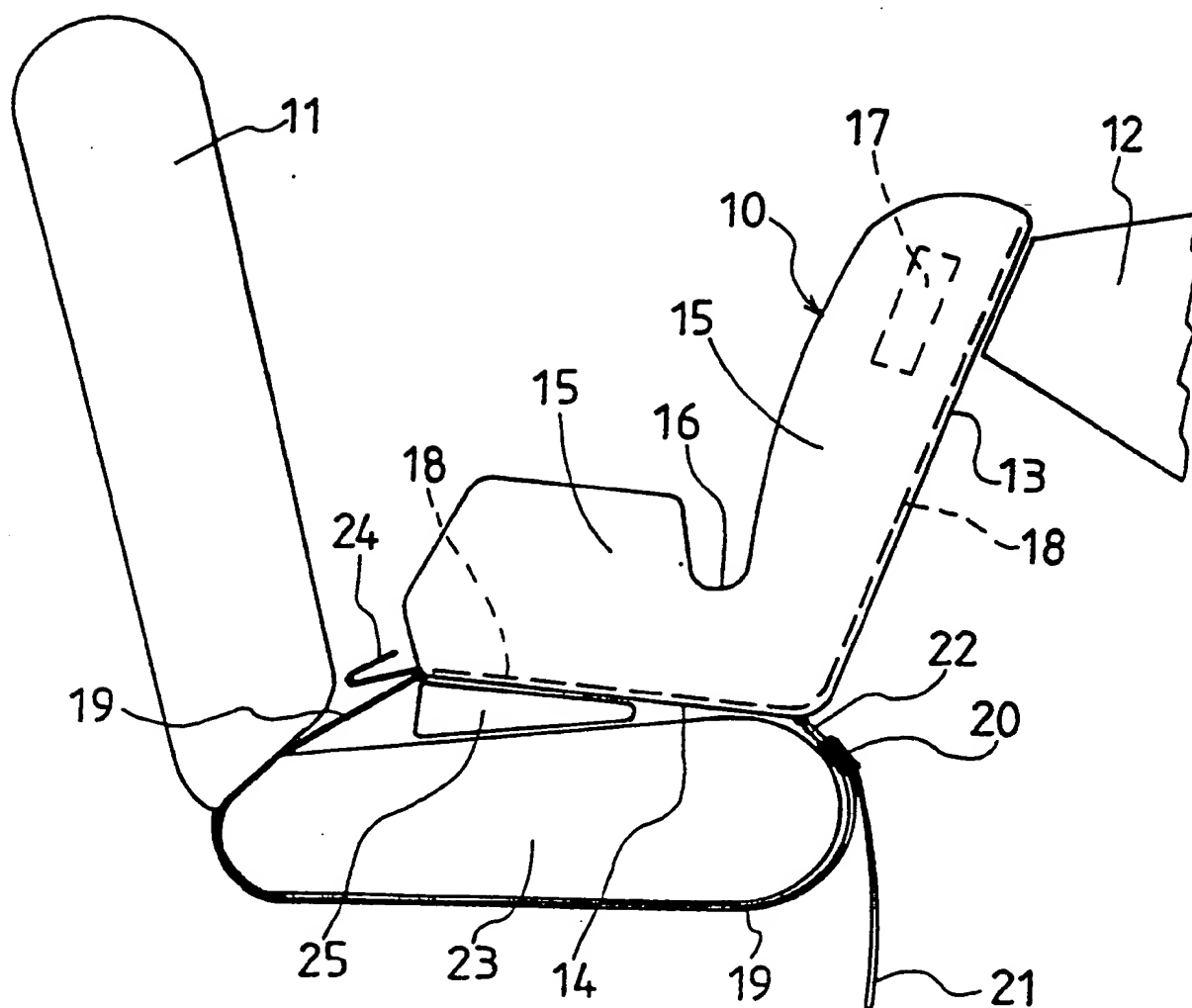






FIG. 5

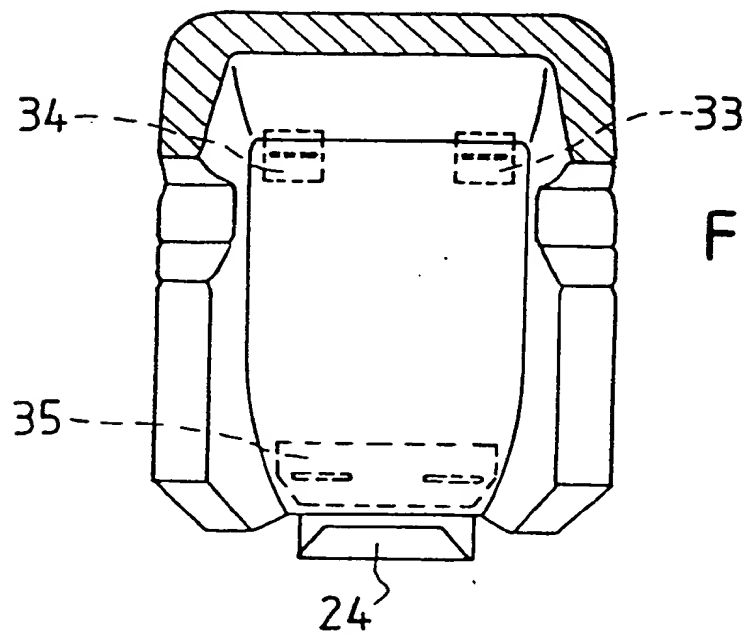
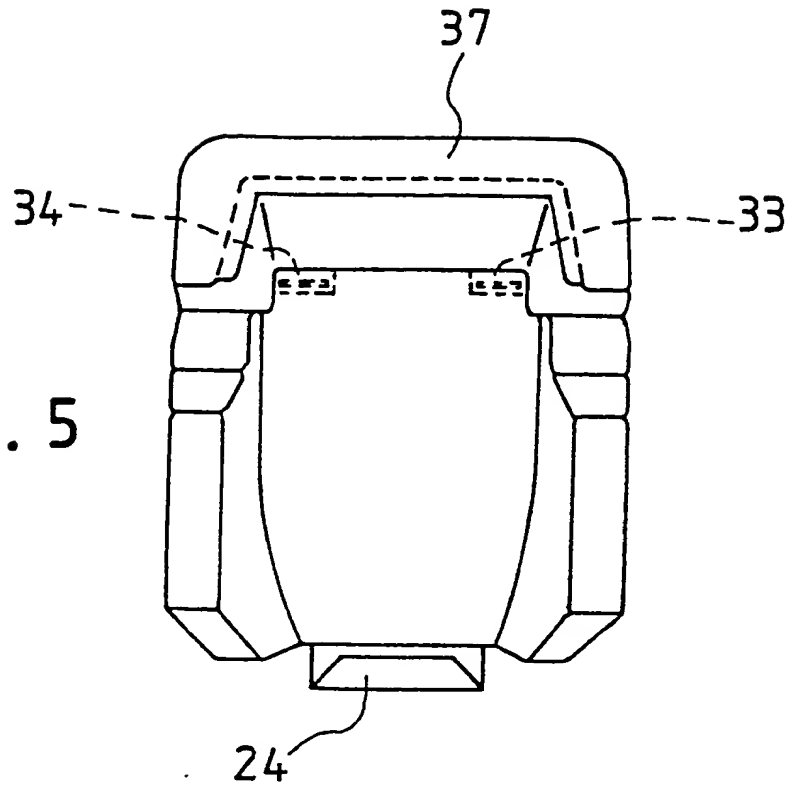
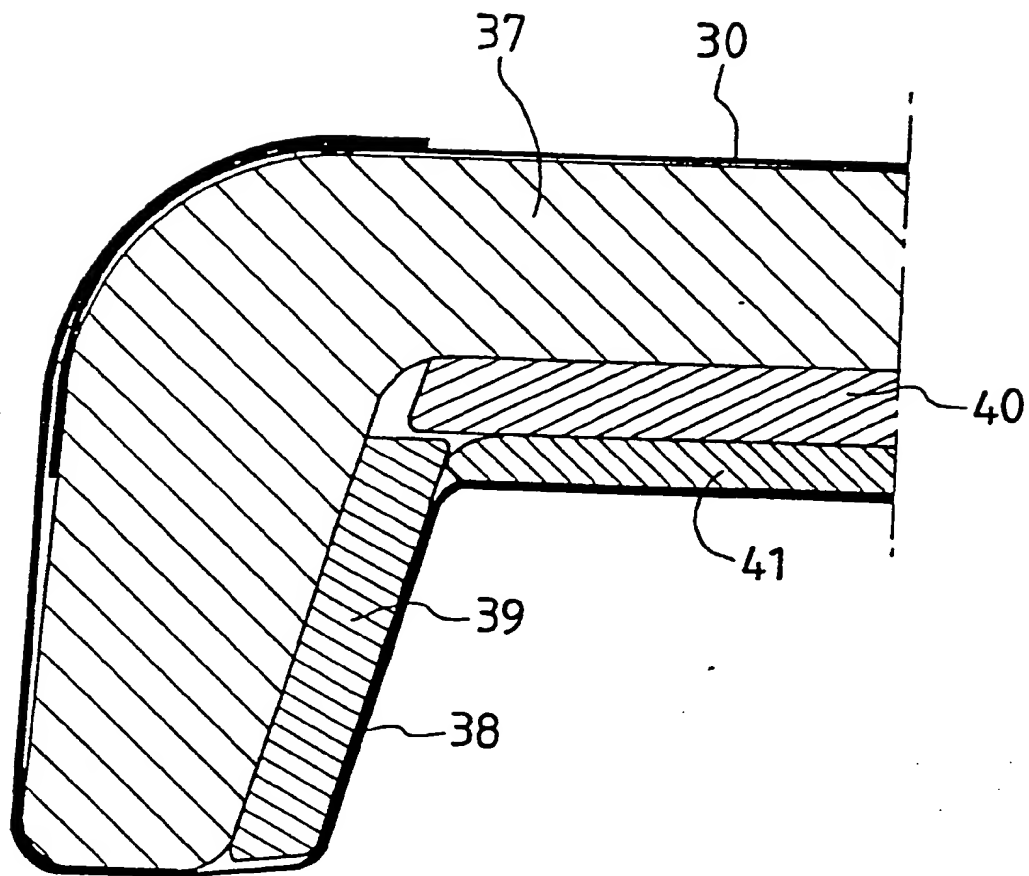


FIG. 7

FIG. 6







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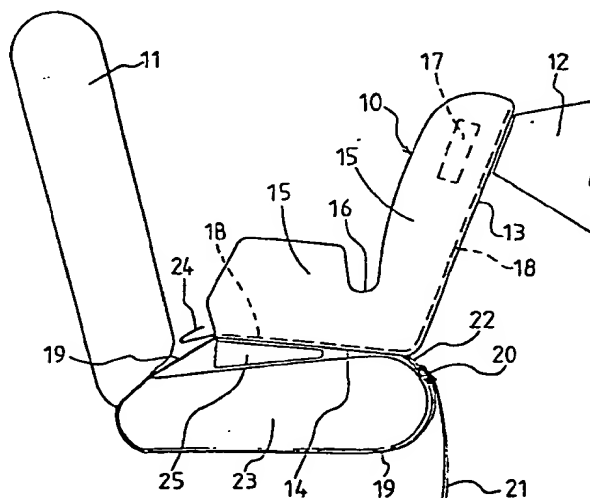
54 A seat.

57 A seat for use as a child seat in a vehicle, comprising a seat member (23), a back member (13) and side members (15).

At least the seat member comprises a layer (18; 30) of a high strength material, for fixing attachment straps (19). The attachment straps are arranged for buckling around an existing seat (23) in the vehicle.

The straps are arranged for tightening also an insert pillow (27) between the bottom of the seat and the seat in the vehicle.

An existing hip belt in the vehicle is arranged to fix the seat by means of an anchoring member (24) at the front edge of the seat attached to the layer of a high strength material.



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# EUROPEAN SEARCH REPORT

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Application Number

EP 86 85 0118

## DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
A	US-A-3 910 634 (MORRIS) * Column 1, line 42 - column 2, line 61; figures *	1,3,6	B 60 N 1/12
A	US-A-3 099 486 (SCOTT) * Column 1, line 53 - column 2, line 37; figures *	1,3,6	
A	FR-A-2 296 354 (GECAR) * Page 1, line 39 - page 2, line 37; figures *	1,4	
A	DE-A-2 327 835 (IRVIN) * Page 3, line 12 - page 6, line 4; figures *	1	
A	EP-A-0 094 318 (RENAULT) * Page 3, line 1 - page 4, line 18; figures *	1,5	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			A 47 D 1/00 B 60 N 1/00 B 60 R 22/00 B 62 B 9/00 B 62 J 1/00
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Place of search THE HAGUE		Date of completion of the search 17-01-1989	Examiner HORVATH R.C.
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